

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Cancelled)

2. (Cancelled)

3. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said X data packets is D_{max} ,

generating X data blocks that have data fields equal to or smaller than D_{max} and a same packet time length by connecting and dividing data parts extracted from data fields of a plurality of data frames to be transmitted, the packet time length being data size or transmission time; and

generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

4. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

setting a maximum data size of said X data packets to a value obtained by ($D_{\max} \times \text{a transmission rate of a corresponding line/the reference transmission rate}$);

generating X data blocks having data fields equal to or smaller than the maximum data size of respective lines and a same packet time by connecting data parts extracted from data fields of a plurality of data frames to be transmitted and dividing the connected data parts in accordance with transmission rates of the respective lines, the packet time length being transmission time; and

generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

5. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said X data packets is D_{max} ,

generating X data series having data fields equal to or smaller than D_{max} by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

generating X data blocks having a same packet time length by adding dummy data to data series of said X data series except one having a largest data size, the packet time length being data size or transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

6. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

setting a maximum data size of said X data packets to a value obtained by ($D_{max} \times \text{a transmission rate of a corresponding line/the reference transmission rate}$);

generating X data series having data fields equal to or smaller than the maximum data size in each line by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

generating X data blocks having a same packet time length by adding dummy data to data series of said X data series except one having a largest packet time length, the packet time length being transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

7. (Cancelled)

8. (Withdrawn) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order and assigning the data frames to said respective transmission media until a total data size reaches a largest size not exceeding the maximum data size D_{max} .

9. (Withdrawn) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size media reaches a largest size not exceeding the maximum data size D_{max} .

10. (Withdrawn) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size D_{max} .

11. (Withdrawn) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by employing one of the methods recited in claims 8 to 10 so that a total number of accommodated data frames is to be a maximum.

12. (Withdrawn) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order and assigning one data frame to each of said respective transmission media until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media.

13. (Withdrawn) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media .

14. (Withdrawn) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the

assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media.

15. (Withdrawn) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by employing one of the methods recited in claims 12 to 14 so that a total number of accommodated data frames is to be a maximum.

16. (Withdrawn) The wireless packet communication method according to Claim 5 or 6, characterized in that

said data series are generated to contain sub-headers for identifying said data frames, respectively.

17. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is D_{max} ,

generating the X data packets by the method recited in claim 1, in a case where a number of data frames to be transmitted is 1;

generating the X data packets by the method recited in claim 3 or 5, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 3 or the aggregation as recited in claim 5; and

generating the X data packets by the method recited in claim 1, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 3 or the aggregation as recited in claim 5.

18. (Withdrawn) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates is a reference transmission rate,

setting a maximum data size of said X data packets to a value by obtained ($D_{\max} \times \text{a transmission rate of a corresponding line/the reference transmission rate}$);

generating the X data packets by the method recited in claim 2, in a case where a number of data frames to be transmitted is 1;

generating the X data packets by the method recited in claim 4 or 6, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 4 or the aggregation as recited in claim 6; and

generating the X data packets by the method recited in claim 2, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 4 or the aggregation as recited in claim 6.

19. (Currently Amended) ~~The wireless packet communication method according to Claim 1, wherein~~ A wireless packet communication method for transmitting X data packets simultaneously between two STAs over plural data transmission paths by using MIMO and a plurality of radio channels determined to be idle by carrier sense and/or by using a radio channel determined to be idle, X corresponding to a total number of MIMOs of the plurality of radio channels determined

to be idle, where Dmax is a value corresponding to the maximum data size of the data packets, the wireless packet communication method comprising:

using at least one of the STAs to perform the following steps:

assessing the respective transmission rates of the plurality of data transmission paths and calculating a size ratio amongst the respective transmission rates, where the size ratio is a ratio between the respective transmission rates for each of the idle radio channels;

obtaining from a transmission buffer associated with one of the STAs at least one data frame to be transmitted;

fragmenting a data part extracted from a data field of the one data frame to be transmitted by applying the size ratio, to generate X data blocks such that each data block requires same amount of time for transmission from one STA to another STA;

generating X data packets by adding, to each data block of the X data blocks, a header field containing control information that includes destination information and an FCS field containing an error checking code;

transmitting the X data packets simultaneously over the plural data transmission paths; and

generating X new data packets ~~generated~~ after the simultaneous transmission of the X data packets ~~are~~ and continuously transmitting the new data packets ~~transmitted~~ continuously without performing carrier sense, until a time corresponding to a transmission time of data packets generated from the said ~~one~~ data frame before fragmentation passes.

20. (Currently Amended) ~~The wireless packet communication method according to Claim 1, wherein~~

A wireless packet communication method for transmitting X data packets simultaneously between two STAs over plural data transmission paths by using MIMO and a plurality of radio channels determined to be idle by carrier sense and/or by using a radio channel determined to be idle, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, where Dmax is a value corresponding to the maximum data size of the data packets, the wireless packet communication method comprising:

using at least one of the STAs to perform the following steps:

assessing the respective transmission rates of the plurality of data transmission paths and calculating a size ratio amongst the respective transmission rates, where the size ratio is a ratio between the respective transmission rates for each of the idle radio channels;

obtaining from a transmission buffer associated with one of the STAs at least one data frame to be transmitted;

fragmenting a data part extracted from a data field of the one data frame to be transmitted by applying the size ratio, to generate X data blocks such that each data block requires same amount of time for transmission from one STA to another STA;

generating X data packets by adding, to each data block of the X data blocks, a header field containing control information that includes destination information and an FCS field containing an error checking code; and

transmitting the X data packets simultaneously over the plural data transmission paths; and

generating and consecutively transmitting X new data packets generated after the simultaneous transmission of the X data packets, are transmitted consecutively wherein the generating and consecutively transmitting step is performed X times without performing carrier sense.

21. (Withdrawn) The wireless packet communication method according to Claims 3 or 4, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal,

selecting data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP;

adding a source address of the device connected to said AP to each of frame bodies of the selected data frames and connecting the frame bodies;

generating said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and

transmitting said X data packets simultaneously.

22. (Withdrawn) The wireless communication method according to Claims 3 or 4, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal,

selecting IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP;

adding a destination address of the device connected to said AP to each of the selected IP packets and connecting the IP packets;

generating said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and

transmitting said X data packets simultaneously.

23. (Withdrawn) The wireless packet communication method according to Claims 5 or 6, characterized by further comprising:

when one of said two APs is an AP and the other is a mobile terminal,

selecting and aggregating data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP;

adding a source address of the device connected to said AP to each of frame bodies of the selected data frames and further adding a MAC header to each of the frame bodies of the selected data frames to generate said X data packets; and transmitting said X data packets simultaneously.

24. (Withdrawn) The wireless packet communication method according to Claims 5 or 6, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal, selecting and aggregating IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP;

adding a destination address of the device connected to said AP to each of the selected IP packets and further adding a MAC header to each of the selected IP packets to generate said X data packets; and transmitting said X data packets simultaneously.

25. (Withdrawn) The wireless packet communication method according to Claim 21, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames address

to the other STA by the method and transmits the data packets in one lump or simultaneously.

26. (Withdrawn) The wireless packet communication method according to Claim 21, characterized in that:

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

27. (Cancelled)

28. (Cancelled)

29. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is D_{max} ,

a unit generating X data blocks that have data fields equal to or smaller than D_{max} and a same packet time length by connecting and dividing data parts extracted from data fields of a plurality of data frames to be transmitted, the packet time length being data size or transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

30. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by $(D_{max} \times \text{a transmission rate of a corresponding line/a reference transmission rate})$;

a unit generating X data blocks that have data fields equal to or smaller than the maximum data size of each line and a same packet time length by connecting data parts extracted from data fields of a plurality of data frames to be transmitted and dividing the connected data parts in accordance with transmission rates of respective lines, the packet time length being transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

31. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is D_{max} ,

a unit generating X data series having data fields equal to or smaller than D_{max} by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

a unit generating X data blocks having a same packet time length by adding dummy data to a data series of said X data series except one having a largest size, the packet time length data size or transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

32. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by $(D_{\max} \times \text{a transmission rate of a corresponding line/the reference transmission rate})$;

a unit generating X data series having data fields equal to or smaller than the maximum data size of each line by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

a unit generating X data blocks having a same packet time length by adding dummy data to a data series of said X data series except one having a largest packet time length, the packet time length being transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

33. (Cancelled)

34. (Withdrawn) The wireless packet communication apparatus according to Claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order and assigning the data frames to said transmission media until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

35. (Withdrawn) The wireless packet communication apparatus according to claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

36. (Withdrawn) The wireless packet communication apparatus according to Claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

37. (Withdrawn) The wireless packet communication apparatus according to Claim 31, characterized in that

the data series are generated by employing one of the units recited in claims 34 to 36 so that a total number of accommodated data frames is to be a maximum.

38. (Withdrawn) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order and assigning the data frames to said transmission media until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

39. (Withdrawn) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame

until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

40. (Withdrawn) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size D_{max} , thereby generating the data series.

41. (Withdrawn) The wireless packet communication apparatus according to Claim 32, characterized in that

the data series are generated by employing one of the units recited in claims 38 to 40 so that a total number of accommodated data frames is to be a maximum.

42. (Withdrawn) The wireless packet communication apparatus according to Claim 31 or 32, characterized in that

said data series are generated to contain sub-headers for identifying said data frames, respectively.

43. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels

determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMO's of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is D_{max} ,

a unit generating X data packets by the unit recited in claim 27, in a case where a number of data frames to be transmitted is 1;

a unit generating X data packets by the unit recited in claim 29 or 31, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than a maximum data size in each line by the connection and division as recited in claim 29 or the aggregation as recited in claim 31; and

a unit generating X data packets by the unit recited in claim 27, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 29 or the aggregation as recited in claim 31.

44. (Withdrawn) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMO's of the plurality of radio channels

determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by $(D_{max} \times \text{a transmission rate of a corresponding line/the reference transmission rate})$;

a unit generating X data packets by the unit recited in claim 28, in a case where a number of data frames to be transmitted is 1;

a unit generating X data packets by the unit recited in claim 30 or 32, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than a maximum data size in each line by the connection and division as recited in claim 30 or the aggregation as recited in claim 32; and

a unit generating X data packets by the unit recited in claim 28, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 30 or aggregation as recited in claim 32.

45. (Currently Amended) ~~The wireless packet communication apparatus according to Claim 27, wherein~~

A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs over plural data transmission paths by using a plurality of radio channels determined to be idle by carrier sense and/or by using a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, and Dmax corresponding to the maximum data size of said data packets, the wireless packet communication apparatus characterized by comprising:

_____ a first unit to assess the respective transmission rates of said plurality of data transmission paths and calculate a size ratio amongst the respective transmission rates, where the size ratio is a ratio between the respective transmission rates for each of the idle radio channels;

_____ a transmission buffer associated with one of said STAs configured to store at least one data frame to be transmitted;

_____ a second unit generating X data blocks that have data fields equal to or smaller than Dmax and that have the same packet time length by fragmenting a data part extracted from a data field of said one data frame to be transmitted by applying said size ratio such that each data block requires same amount of time for transmission from one STA to another STA;

_____ a third unit generating X data packets by adding, to each of said X data blocks, a header field containing control information that includes destination information and an FCS field containing an error checking code, to transmit said X data packets simultaneously; and

a fourth unit that transmits the X data packets simultaneously over said plural data transmission paths, wherein

for a time period corresponding to a transmission time of the data packets generated from the data frame, the third unit generates X new data packets-generated after the simultaneous transmission of the X data packets, and the fourth unit-are transmitted-continuously transmits the X new data packets without performing carrier sense, until a time corresponding to a transmission time of data packets generated from said one data frame before being fragmented passes.

46. (Currently Amended) ~~The wireless packet communication apparatus according to Claim 27, wherein~~

A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs over plural data transmission paths by using a plurality of radio channels determined to be idle by carrier sense and/or by using a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, and Dmax corresponding to the maximum data size of said data packets, the wireless packet communication apparatus characterized by comprising:

a first unit to assess the respective transmission rates of said plurality of data transmission paths and calculate a size ratio amongst the respective transmission rates, where the size ratio is a ratio between the respective transmission rates for each of the idle radio channels;

a transmission buffer associated with one of said STAs configured to store at least one data frame to be transmitted;

a second unit generating X data blocks that have data fields equal to or smaller than Dmax and that have the same packet time length by fragmenting a data part extracted from a data field of said one data frame to be transmitted by applying said size ratio such that each data block requires same amount of time for transmission from one STA to another STA;

a third unit generating X data packets by adding, to each of said X data blocks, a header field containing control information that includes destination information and an FCS field containing an error checking code, to transmit said X data packets simultaneously; and

a fourth unit that transmits the X data packets simultaneously over said plural data transmission paths, wherein

for X consecutive iterations, the third unit generates and consecutively transmits X new data packets—generated—after the simultaneous transmission of the X data packets are transmitted simultaneously consecutively X-times without performing carrier sense.

47. (Withdrawn) The wireless packet communication apparatus according to Claims 29 or 30, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,
the wireless packet communication apparatus selects data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a

range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP; adds a source address of the device connected to said AP to each of frame bodies of the selected data frames and connects the frame bodies; adds a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions to generate said X data packets; and transmits said X data packets simultaneously.

48. (Withdrawn) The wireless communication apparatus according to Claims 29 or 30, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,
the wireless packet communication apparatus selects IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP; adds a destination address of the device connected to said AP to each of the selected IP packets and connects the IP packets; generates said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and transmits said X data packets simultaneously.

49. (Withdrawn) The wireless packet communication apparatus according to Claims 31 or 32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects and aggregates data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the aggregated data frames are able to be accommodated in respective data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP; adds a source address of the device connected to said AP to each of frame bodies of the selected data frames and further adds a MAC header to each of the frame bodies of the selected data frames to generate said X data packets; and transmits said X data packets simultaneously.

50. (Withdrawn) The wireless packet communication apparatus according to Claims 31 or 32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects and aggregates IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in respective data packets to be transmitted simultaneously, the transmission buffer storing IP packets to a device connected to said AP; adds a destination address of the device connected to said AP to each of the selected IP packets and further adds a MAC

header to each of the selected IP packets to generate said X data packets; and transmits said X data packets simultaneously.

51. (Withdrawn) The wireless packet communication apparatus according to Claim 47, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

52. (Withdrawn) The wireless packet communication apparatus according to Claim 47, characterized in that

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

53. (Withdrawn) The wireless packet communication apparatus according to Claim 48, characterized in that

when one of said two STAB transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from

data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

54. (Withdrawn) The wireless packet communication apparatus according to Claim 49, characterized in that

when one of said two STAB transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

55. (Withdrawn) The wireless packet communication apparatus according to Claim 50, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

56. (Withdrawn) The wireless packet communication apparatus according to Claim 48, characterized in that

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data

packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

57. (Withdrawn) The wireless packet communication apparatus according to Claim 49, characterized in that

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

58. (Withdrawn) The wireless packet communication apparatus according to Claim 50, characterized in that

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the unit and transmits the data packets in one lump or simultaneously.

59. (Withdrawn) The wireless packet communication method according to Claim 22, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

60. (Withdrawn) The wireless packet communication method according to Claim 23, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

61. (Withdrawn) The wireless packet communication method according to Claim 24, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

62. (Withdrawn) The wireless packet communication method according to Claim 22, characterized in that:

a communication device is connected to each of said two STAs; and

when one of said two STAB transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

63. (Withdrawn) The wireless packet communication method according to Claim 23, characterized in that:

a communication device is connected to each of said two STAB; and

when one of said two STAB transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.

64. (Withdrawn) The wireless packet communication method according to Claim 24, characterized in that:

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, the one STA generates data packets from data frames addressed to the other STA by the method and transmits the data packets in one lump or simultaneously.